Moreover, if we assume that 19·8 is the velocity at 100 feet, the velocity at 1,600 feet calculated from it by this formula would be almost exactly *equal* to that observed, instead of *four* times as much as it was when calculated from $\frac{V}{v} = \frac{H}{h}$. The empirical formula $v = 28{\cdot}1 + 0{\cdot}2 \sqrt{h}$, where v is the velocity in feet per second, and h is the corresponding height in feet, gives for the four elevations above, results in close agreement with those observed, but it would probably fail below 1,600 feet.

Mr. Stevenson in his first paper uses a formula $\frac{F}{f} = \sqrt{\frac{H}{h}}$ where Ff are the forces ("pressures" I suppose is meant by this objectionable word) at the two levels corresponding to H and h.

In his second paper he says he prefers the formula $\frac{V}{v} = \frac{H}{h} = \frac{P}{p}$, where P and p are the pressures at the two levels to the formula $\frac{V}{v} = \frac{\sqrt{H}}{\sqrt{h}}$, from which and some other remarks it would appear that pressure and velocity are considered to vary directly with each other. This is a notion which is certainly at variance not only with the hitherto generally accepted empirical formulæ, but is distinctly contrary to the results lately deduced by Mr. Ferrel from the hydrodynamical theory (see Van Nostrand's *Engineering Magazine*, vol. xxvii. p. 141). The formula usually found in the text-books is $p = {\cdot}00492\, v^2$, and the one deduced by Ferrel is

$$p = \frac{{\cdot}0027}{1 + {\cdot}003665\, t} \frac{P}{P'} v^2,$$

where $P\,P'$ are the barometric pressures at the level under consideration and at sea-level respectively, and t is the temperature in degrees Centigrade; and though from the latter formula it is evident that the pressure at the higher levels will be less for the same velocity than below (at the height of Mont Blanc, for example, it would be reduced by about one-half) there is nothing to lead us to infer that $\frac{V}{v} = \frac{P}{p}$.

If in the formula $\frac{F}{f} = \sqrt{\frac{H}{h}}$ which was discarded by Mr. Stevenson, we make the ordinary assumption that $\frac{F}{f} = \frac{V^2}{v^2}$ we get the formula which I have already shown gives results which agree closely with the values observed by Vettin above 1,600 feet, and which even below this height is much nearer the truth so far as can be inferred from the slender data employed, than the formula preferred by Mr. Stevenson.

If we take the heights as abscissæ, the curve traced out by the velocity-ordinates will be much flatter than the ordinary conical parabola, and at great heights will approximate very nearly to a straight line parallel to the axis. Ferrel's increment-term makes it a straight line all through, but his formula assumes that the temperature gradient between the pole and the equator is the same above as at the earth's surface, it leaves out friction altogether, and also supposes the velocity for the same gradient to be the same at all heights, whereas according to theory it should increase with the height in the ratio $\frac{\cos i}{P}$, where i is the angle the wind makes with the isobar, and P is the barometric pressure at the level under consideration. Notwithstanding these omitted factors, of which the first and last probably tend to destroy each other, it will be found that the addition of the increment corresponding to each altitude to the velocity at the surface observed by Vettin gives us the following fair approximation to the values actually observed, though the calculated values are too small at 1600 feet and too large at 23,000 feet by just about the same amount:—

Height.	Velocity observed.	Calculated from Ferrel's Formula.
23,000	59·5	75·0
12,800	51·8	50·5
7,200	35	37·0
3 800	30·4	28·9
1,600	37·4	23·6
0	19·8	

In conclusion, it is evident that, quite apart from the meteorological side of the question, more investigations like those undertaken by Mr. Stevenson, are urgently required to determine the actual rate of increase of the velocity at moderate heights, from which a formula like the one I have recommended may be deduced, which will yield values more within the range of probability than those furnished by the one which is apparently supposed to suffice for the rest of the atmosphere after we have reached the top of the fifty-foot pole.

E. DOUGLAS ARCHIBALD

KRAO, THE "HUMAN MONKEY"

THROUGH the courtesy of Mr. Farini, I have had a private interview with this curious little waif, which he is now exhibiting at the Royal Aquarium, Westminster, and for which he claims the distinction of being the long-sought-for "missing link" between man and the Anthropoid apes. Krao certainly presents some abnormal peculiarities, but they are scarcely of a sufficiently pronounced type to justify the claim. She is, in fact, a distinctly human child, apparently about seven years old, endowed with an average share of intelligence, and possessing the faculty of articulate speech. Since her arrival about ten weeks ago in London, she has acquired several English words, which she uses intelligently, and not merely parrot-fashion, as has been stated. Thus, on my suddenly producing my watch at the interview, she was attracted by the glitter, and cried out *c'ock, c'ock*, that is, *clock, clock!* This showed considerable powers of generalisation, accompanied by a somewhat defective articulation, and it appears that her phonetic system does not yet embrace the liquids *l* and *r*. But in this and other respects her education is progressing favourably, and she has already so far adapted herself to civilised ways, that the mere threat to be sent back to her own people is always sufficient to suppress any symptoms of unruly conduct.

Physically Krao presents several peculiar features. The head and low forehead are covered down to the bushy eyebrows with the deep black, lank, and lustreless hair, characteristic of the Mongoloid races. The whole body is also overgrown with a far less dense coating of soft, black hair about a quarter of an inch long, but nowhere close enough to conceal the colour of the skin, which may be described as of a dark olive-brown shade. The nose is extremely short and low, with excessively broad nostrils, merging in the full, pouched cheeks, into which she appears to have the habit of stuffing her food, monkey-fashion. Like those of the anthropoids her feet are also prehensile, and the hands so flexible that they bend quite back over the wrists. The thumb also doubles completely back, and of the four fingers, all the top joints bend at pleasure independently inwards. Prognathism seems to be very slightly developed, and the beautiful round black eyes are very large and perfectly horizontal. Hence the expression is on the whole far from unpleasing, and not nearly so ape-like as that of many Negritos, and especially of the Javanese "Ardi," figured by me in NATURE, vol. xxiii. p. 200. But it should be mentioned that when in a pet, Krao's lips are said to protrude so far as to give her "quite a chimpanzee look."

Apart from her history one might feel disposed to

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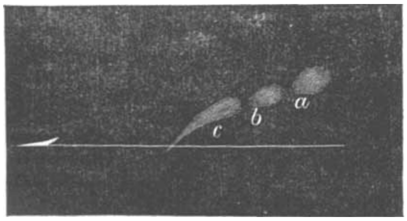
regard this specimen merely as a "sport" or *lusus naturæ*, possessed rather of a pathological than of a strictly anthropological interest. Certainly isolated cases of hairy persons, and even of hairy families, are not unknown to science. Several were figured in a recent number of the Berlin *Zeitschrift für Ethnologie*, and, if I remember, both Crawfurd ("Journal of an Embassy to Ava") and Col. Yule ("Mission to the Court of Ava") speak of a hairy family resident for two or three generations at the Burmese capital. This family is reported to have come originally from the interior of the Lao country, and in the same region we are now told that little Krao and her parents, also hairy people, were found last year by the well-known eastern explorer, Mr. Carl Bock. Soon after their capture, the father appears to have died of cholera, while the mother was detained at Bangkok by the Siamese Government, so that Krao alone could be brought to England. But before his death a photograph of the father was taken by Mr. Bock, who describes him as "completely covered with a thick hairy coat, exactly like that of the anthropoid apes. On his face not only had he a heavy, bushy beard and whiskers, similar in every respect to the hairy family at the court of the King of Burmah, who also came from the same region as that in which Krao and her father were found; but every part was thoroughly enveloped in hair. The long arms and the rounded stomach also proclaimed his close alliance to the monkey-form, while his power of speech and his intelligence were so far developed that before his death he was able to utter a few words in Malay."

Assuming the accuracy of these statements, and of this description, little Krao, of course, at once acquires exceptional scientific importance. She would at all events be a living proof of the presence of a hairy race in Further India, a region at present mainly occupied by almost hairless Mongoloid peoples. From these races the large straight eyes would also detach the Krao type, and point to a possible connection with the hairy, straight-eyed Aino tribes still surviving in Yesso and Sakhalin, and formerly widely diffused over Japan and the opposite mainland.[1]

A. H. KEANE

FIGURE OF THE NUCLEUS OF THE BRIGHT COMET OF 1882 (GOULD)[2]

ALTHOUGH this comet presented a beautiful spectacle, when seen with the naked eye, I have been disappointed at the small amount of work which I have been able to do in the way of accurate observation. I give herewith the only two good sketches which I have been able to make. The aperture employed was 15 inches, and the power was 145 diameters.

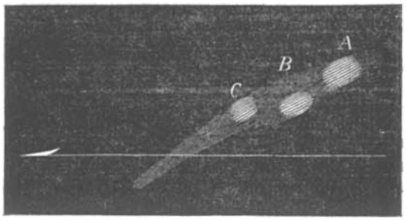


1882, October 13.

1882, *October* 13.—(See the figure.) The nucleus is curved as in the drawing. It consists of three masses. I am sure of a break at *a;* tolerably sure of the break at *b*, and I suspect a break at *c*, but I am not certain of it.

1882, *October* 14.—The night is very poor. (In general the appearances of last night are confirmed.) The nucleus is about 1′ long.

1882, *October* 17.—(See the figure.) There are three masses, plainly separated. *B* is farther north than the line *A*—*C* by 3—4″. There is a dark division between each pair of masses. *B* and *C* are nearly in the parallel.



1882, October 17.

The brush of light from the mass *A* toward the east, comes from the south side of *A*, as it is drawn. From the W. end of *A* to the E. end of the brush of light, is about 15″.

1882, *October* 18.—The dark space between *A* and *B* is about 10″; it is as wide as *A* itself, and wider than on October 17. *C* is certainly seen as a separate mass; *A* and *B* are bright and stellar in appearance, more so than on October 17. *C* is, however, fainter than then. The dark axis of the tail extends quite up to the coma.

1882, *October* 19.—Cloudy. The nucleus is seen as before. *A* and *B* are seen, as also the dark space between them. *C* is not seen, but this is probably on account of the unsteady air.

I regret that my opportunity did not allow me to make any further sketches of value.

Washburn Observatory, University of Wisconsin,
Madison, November 3, 1882

NOTES

THE office of Director of the Geological Survey of Scotland, vacant by the promotion of Mr. Geikie to be Director-General, has been filled up by the appointment of Mr. H. H. Howell, District Surveyor of the Geological Survey of Scotland during the earlier years of its progress, but who since the separation of the Scottish branch of the establishment in 1867, has been continuously employed in England, where he has personally surveyed large tracts of the northern counties, and where for some years past he has had the direct personal supervision of the whole of the field-work in that district. He will not be able to enter fully on his duties in Scotland until the area now under his charge in the north of England has been completely surveyed. The promotion of Mr. Howell having caused a vacancy in the rank of District Surveyor, Mr. W. Whitaker has been appointed to the post. This geologist is well known for his detailed surveys of the Tertiary deposits of the London basin. He is at present engaged in the survey of Norfolk.

THE United States Transit of Venus expedition, under Prof. Newcomb, arrived at Plymouth on Sunday as passengers by the Union Steamship Company's steamer *Moor*, from Cape Town. They report that their observations were made at Wellington, fifty-eight miles from Cape Town, under extremely favourable conditions, two good observations of internal contact and 236 photographs being obtained, of which more than 200 can be measured.

THE annual general meeting of the Association for the Improvement of Geometrical Teaching will be held, through the kindness of the Council, at University College, Gower Street, on Wednesday, the 17th instant, at 11 a.m. In addition to the usual routine business, the president (R. B. Hayward, F.R.S.)

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[1] See my paper on "Aino Ethnology" in NATURE, vol. xxvi. p. 524.

[2] Paper by Prof. Edward S. Holden, in the *American Journal of Science and Arts.*

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